

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

1-30. (Canceled)

31. (Previously presented) A method for identifying a candidate compound useful for inhibiting meiosis in a cell, comprising:

- a) contacting MSH5 protein with a test compound;
- b) determining the meiotic activity of the MSH5 protein in the presence of said test compound;
- c) selecting a compound that inhibits the meiotic activity of the MSH5 protein; and,
- d) identifying said selected compound as a candidate compound useful for inhibiting meiosis in a cell.

32. (Previously presented) A method for identifying a candidate compound useful for inhibiting meiosis in a cell, comprising:

- a) contacting a cell expressing an MSH5 gene with a test compound;
- b) determining the expression of the MSH5 gene or the meiotic activity of MSH5 in the presence of said test compound;
- c) selecting a compound that inhibits the expression of the MSH5 gene or the meiotic activity of MSH5; and,
- d) identifying said selected compound as a candidate compound useful for inhibiting meiosis in a cell.

33. (Previously presented) The method of claim 32, wherein said cell is an oocyte or a spermatocyte.

34. (Previously presented) A method for identifying a candidate compound which prevents fertilization in a subject comprising:

- a) contacting MSH5 protein with a test compound; and,

b) assaying for modulation of the meiotic activity of MSH5 in the presence of said test compound, wherein inhibition of the meiotic activity of MSH5 by the test compound identifies the test compound as a candidate compound which prevents fertilization in a subject.

35. (Previously presented) A method for identifying a candidate compound which prevents fertilization in a subject comprising:

- a) contacting a cell expressing an MSH5 gene with a test compound; and,
- b) assaying for modulation of the expression or meiotic activity of MSH5 in the presence of said test compound, wherein inhibition of the expression or meiotic activity of MSH5 by the test compound identifies the test compound as a candidate compound which prevents fertilization in a subject.

36-44. (Canceled)

45. (Previously presented) The method of claim 34, wherein said compound is a small molecule.

46. (Previously presented) The method of claim 34, wherein said compound is an MSH5 antibody.

47. (Previously presented) The method of claim 34, wherein said compound is a peptide.

48. (Previously presented) The method of claim 34, wherein said compound is a peptidomimetic.

49. (Previously presented) The method of claim 34, wherein said compound inhibits the activity of an MSH5 substrate.

50. (Previously presented) The method of claim 35, wherein said compound is an antisense MSH5 nucleic acid molecule.

51. (Previously presented) The method of claim 35, wherein said compound is a small molecule.

52. (Previously presented) The method of claim 35, wherein said compound is an MSH5 antibody.

53. (Previously presented) The method of claim 35, wherein said compound is a peptide.

54. (Previously presented) The method of claim 35, wherein said compound is a peptidomimetic.

55. (Previously presented) The method of claim 35, wherein said compound inhibits the activity of an MSH5 substrate.

56-67. (Canceled)

68. (Previously presented) A method for identifying a candidate compound useful for stimulating chromosome synapsis in a cell, comprising:

- a) contacting MSH5 protein with a test compound;
- b) determining the meiotic activity of the MSH5 protein in the presence of said test compound;
- c) selecting a compound that stimulates the meiotic activity of the MSH5 protein; and,
- d) identifying said selected compound as a candidate compound useful for stimulating chromosome synapsis in a cell.

69. (Previously presented) A method for identifying a candidate compound useful for stimulating chromosome synapsis in a cell, comprising:

- a) contacting a cell expressing an MSH5 gene with a test compound;
- b) determining the expression of the MSH5 gene or the meiotic activity of

MSH5 in the presence of said test compound;

- c) selecting a compound that stimulates the expression of the MSH5 gene or the meiotic activity of MSH5; and,
- d) identifying said selected compound as a candidate compound useful for stimulating chromosome synapsis in a cell.

70. (Previously presented) A method for identifying a candidate compound useful for inhibiting chromosome synapsis in a cell, comprising:

- a) contacting MSH5 protein with a test compound;
- b) determining the activity of the MSH5 protein in the presence of said test compound;
- c) selecting a compound that inhibits the meiotic activity of the MSH5 protein; and,
- d) identifying said selected compound as a candidate compound useful for inhibiting chromosome synapsis in a cell.

71. (Previously presented) A method for identifying a candidate compound useful for inhibiting chromosome synapsis in a cell, comprising:

- a) contacting a cell expressing an MSH5 gene with a test compound;
- b) determining the expression of the MSH5 gene or the meiotic activity of MSH5 in the presence of said test compound;
- c) selecting a compound that inhibits the expression of the MSH5 gene or the meiotic activity of MSH5; and,
- d) identifying said selected compound as a candidate compound useful for inhibiting chromosome synapsis in a cell.